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Bibliography

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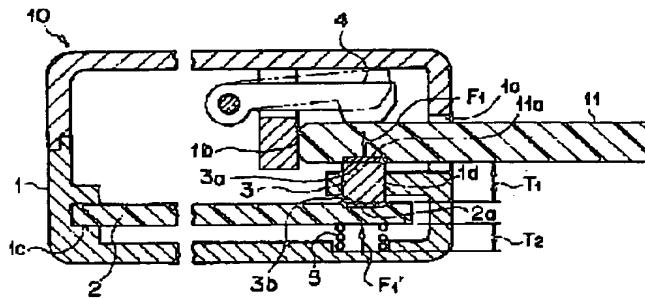
Summary

(57) [Abstract]

[Technical problem] The memory card wearing equipment which can perform electrical installation of memory card certainly is offered.

[Means for Solution] Memory card 11 is inserted in the main part 1 of a device, and if a pressure-welding position is made to rotate the pressure-welding maintenance lever 4, it will be in a memory card wearing state. In this wearing state, the connector 3 is energized up by the coil spring 5 through the circuit board 2, and the pressure welding of the electric conduction contact surfaces 3a and 3b is carried out to the contact group of memory card 11, and the contact group of the circuit board 2. Since the elastic modulus is set as the small value by the above-mentioned coil spring 5's, even if the position of the pressure-welding maintenance lever 4 and the thickness of a connector 3 change, there is little change of a contact pressure and it can maintain the electric contact state by which the connector was stabilized.

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CLAIMS

[Claim(s)]

[Claim 1] Memory card wearing equipment which makes it flow through the contact prepared in the above-mentioned memory card by equipping the predetermined part of electronic equipment with the memory card characterized by providing the following, and the contact prepared in the contact attachment component of the above-mentioned electronic equipment electrically. The connector formed in the both sides of the contact prepared in the predetermined field of the above-mentioned memory card, and the contact prepared in the above-mentioned contact attachment component by the electrical conductive gum which carries out a pressure welding and makes electrical installation possible. The memory card sink stage which locates the field of an opposite side in the predetermined height of the direction of a pressure welding with the above-mentioned predetermined field of the memory card by which wearing was carried out [above-mentioned], and the elastic member which turns the above-mentioned connector to the contact of memory card, and is energized through the above-mentioned contact attachment component in the state where it was equipped with the above-mentioned memory card

[Claim 2] Memory card wearing equipment according to claim 1 characterized by setting up the elastic modulus of the above-mentioned elastic member so that the energization force to the contact of the memory card by the above-mentioned elastic member may serve as abbreviation regularity to movement in predetermined within the limits of the above-mentioned contact attachment component.

[Claim 3] The above-mentioned elastic member is a coil spring, the claim 1 characterized by being a flat spring, or memory card wearing equipment according to claim 2.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to memory card wearing equipment.

[0002]

[Description of the Prior Art] In recent years, it is the electrical conductive gum in which elastic deformation is possible, and it has the conductivity of the thickness direction which is mainly the press direction, and the various commercialization of the electronic equipment which applied the electrical conductive gum to which the laminating of the current carrying part and insulating layer of the line which intersects perpendicularly with the direction of a train of a connection side contact was carried out in the minute pitch, for example, zebra rubber, as a connector for electrical installation between the circuit board and a liquid crystal display board or between a printed circuit board and memory card is carried out.

[0003] In the case of the electronic equipment which applies the above-mentioned connector made of an electrical conductive gum to a connector with a liquid crystal display board, usually, since the liquid crystal display board [itself] attachment and detachment are not carried out, the electrical installation state stabilized from the compressibility of the connector made of an electrical conductive gum being set up, and the range of the amount of compressive force being decided, and there being no removal operation is acquired by making the related size of an attaching member into a predetermined precision.

[0004] On the other hand, as shown in the cross section of drawing 3 , the connector 103 by the side of the main part of a device is arranged on contact 102a for connection of the circuit board 102, and the memory card wearing equipment which applies the above-mentioned connector made of an electrical conductive gum as a connector with memory card has the thing of the structure where the pressure-welding maintenance lever 104 in which the rotation for memory card press is possible was formed above the connector 103. In addition, the lower part of the circuit board 102 of the lower part of the above-mentioned connector 103 is supported by height 101a of the main part 101 of a device, and receives the contact pressure of the above-mentioned pressure-welding maintenance lever 104.

[0005] In the case of the above-mentioned memory card wearing equipment, it will be in the wearing state of memory card 111 by changing the above-mentioned pressure-welding maintenance lever 104 into a release state for memory card 111, and rotating this maintenance lever 104 in the direction of a pressure welding after insertion. If equipped with memory card 111, contact 111a by the side of this card and contact 102a by the side of a device will be pressed with the pressure-welding maintenance lever 104 through the above-mentioned connector 103, and will be in an electrical installation state, and the transfer of the information on memory card and electronic equipment of them will be attained.

[0006] In addition, the above-mentioned memory card 111 has the metal contact surface of the multipoint arranged on the flat surface as the contact 111 for connection a. On the other hand, the above-mentioned connector 103 has the conductivity of the thickness direction which is mainly the press direction, and consists of electrical conductive gums to which the laminating of the current carrying part and insulating layer of the line which intersects perpendicularly in the direction of a train of the above-mentioned contact for connection was carried out in the minute pitch and in which elastic deformation is possible, for example, zebra rubber etc.

[0007]

[Problem(s) to be Solved by the Invention] However, it sets on the above-mentioned conventional electronic equipment etc., and is the thickness size T0 at the time of the pressure welding of the above-mentioned connector 103. It is decided in the position of the point position of the pressure-welding maintenance lever 104, the thickness of memory card 100, the thickness of the circuit board 102, and the height of device case supporter 101a, and becomes settled with the size of the few abbreviation rigid body of those elastic deformation. On the other hand, the amount of contact pressures for electrical installation is decided by the amount of compression by the elastic deformation of the connector 103 formed with zebra rubber.

[0008] Therefore, thickness size T0 at the time of the above-mentioned pressure welding When it was not avoided that the above-mentioned amount of contact pressures changes a lot with dispersion, such as thickness which also added the secular change before the pressure welding of a connector 103, but it became poor [the electrical installation of a connector] when a contact pressure was insufficient, and becoming excessive, degradation of a connector 103, the injury on for a contact surface, etc. may have been received.

[0009] this invention is made in order to solve above-mentioned fault, the sticking-by-pressure ability of the device side connector for memory card connection is stabilized, it cannot generate the poor contact by secular change etc. easily, and aims at offering the memory card wearing equipment with which a good electrical installation state is acquired.

[0010]

[Means for Solving the Problem] The 1st memory card wearing equipment of this invention by equipping the predetermined part of electronic equipment with memory card It is memory card wearing equipment which makes it flow through the contact prepared in the above-mentioned memory card, and the contact prepared in the contact attachment component of the above-mentioned electronic equipment electrically. The connector formed in the both sides of the contact prepared in the predetermined field of the above-mentioned memory card, and the contact prepared in the above-mentioned contact attachment component by the electrical conductive gum which carries out a pressure welding and makes electrical installation possible, In the memory card sink stage which locates the field of an opposite side in the predetermined height of the direction of a pressure welding with the above-mentioned predetermined field of the memory card by which wearing was carried out [above-mentioned], and the state where it was equipped with the above-mentioned memory card, the above-mentioned connector is turned to the contact of memory card, and the elastic member energized through the above-mentioned contact attachment component is provided. In the memory card wearing equipment of the above 1st, after equipping with memory card, if the memory card sink stage will be in the state of holding memory card by the position, the pressure welding of the above-mentioned connector will be carried out by the energization force of the above-mentioned elastic member towards memory card through the above-mentioned contact attachment component.

[0011] The elastic modulus of the above-mentioned elastic member is set up so that the energization force to the contact of the memory card according [the 2nd memory card wearing equipment of this invention / on the 1st memory card wearing equipment and] to the above-mentioned elastic member may serve as abbreviation regularity to movement in predetermined within the limits of the above-mentioned contact attachment component. In the memory card wearing equipment of the above 2nd, the energization force of an elastic member is held at abbreviation regularity, and the contact pressure to the memory card of a connector also serves as abbreviation regularity.

[0012] In the 1st or the 2nd memory card wearing equipment, the above-mentioned elastic member of the 3rd memory card wearing equipment of this invention is a coil spring or a flat spring. In the memory card wearing equipment of the above 3rd, the pressure welding of the above-mentioned connector is carried out by the elastic force of the above-mentioned coil spring or a flat spring towards memory card through the above-mentioned contact attachment component.

[0013]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained based on drawing. Drawing 1 is the cross section showing the electronic equipment 10 by which the memory card wearing equipment in which the gestalt of operation of the 1st of this invention is shown was incorporated, and the memory card with which it was equipped. The memory card 11 applied to this electronic

equipment 10 is the IC memory in which solid-state memory was built, and contact group 11a for electrical connection is prepared in the path-of-insertion front inferior-surface-of-tongue section.

[0014] The point is supported for the circuit board 2 as a contact attachment component which has contact group 2a for connection in a point in the connector 3 in main part supporter 1c in the state in which a pressure welding is possible and which can be range vertical displaced by the main part 1 of a device of the above-mentioned electronic equipment 10. Moreover, the connector 3 supported by 1d of main part supporters is arranged in the upper part of the above-mentioned contact group 2a. Moreover, the pressure-welding maintenance lever 4 as a memory card sink stage where an operation edge is located in the position of the field of the opposite side of a field with contact group 11a of the memory card 11 with which it is equipped and which can be rotated is arranged.

[0015] Furthermore, where the field of the opposite side of a field with contact group 2a of the circuit board 2 is contacted, the main part 1 of a device is attached, and the coil spring 5 as an elastic member with an elastic modulus k is arranged. When it is equipped with memory card 11 so that it may mention later, and it is held by the pressure-welding maintenance lever 4 at predetermined height, contact group 2a, a connector 3, and contact group 11a of memory card 11 are in above-mentioned energization force $F1'$, abbreviation, etc. by carrying out through the circuit board 2 by energization force $F1'$ of the above-mentioned coil spring 5, and it is a contact pressure $F1$. It will be in the state where a pressure welding is carried out.

[0016] In addition, the above-mentioned connector 3 has the conductivity of the thickness direction which is mainly the press direction, and is formed by the electrical conductive gum to which the laminating of the current carrying part and insulating layer of the linear minute pitch which intersects perpendicularly in the direction of a train of the above-mentioned contact groups 11a and 2a is carried out and in which elastic deformation is possible, for example, zebra rubber etc. Moreover, the field which contacts the above-mentioned contact groups 11a and 2a of a connector 3, and makes electrical connection possible forms the electric conduction contact surfaces 3a and 3b.

[0017] Next, operation which equips with memory card 11 the electronic equipment 10 of the form of this operation constituted as mentioned above is explained. It inserts until it contacts stopper 1b of the main part of a device from insertion opening 1a, where it rotated the above-mentioned pressure-welding maintenance lever 4 and memory card 11 is released from a pressure-welding position. Then, if a pressure-welding position is made to rotate the pressure-welding maintenance lever 4, it will be in the wearing state of memory card 11. Memory card 11 is positioned by predetermined height in this state. And a connector 3 is somewhat compressed by the energization force of a coil spring 5, and it is thickness $T1$. It becomes and the electric conduction contact surfaces 3a and 3b are [contact group 11a of memory

card 11 and contact group 2a of the circuit board 2 and] contact pressures F1, respectively. A pressure welding is carried out, it will be in an electrical installation state, and transfer of the information on memory card and electronic equipment will be attained.

[0018] In addition, when removing memory card 11, the pressure-welding maintenance lever 4 is made into a release state. Although the point of the circuit board 2 displaces upward slightly by the energization force of a coil spring 5, the undersurface of 1d of connector supporters of the main part of a device is contacted, since memory card 11 will be in a free state, it is lost, and removal of it is attained. [of the contact pressure to contact group 11a]

[0019] in the above, it explained -- as -- the electronic equipment 10 of the form of this operation -- setting -- the wearing state of memory card 11 -- energization force F1 ' of a coil spring 5 -- the memory card of a connector 3, and stable contact pressure F1 to the contact groups 2a and 11a of the circuit board It is given.

[0020] Namely, thickness T1 also including the secular change at the time of the height of the pressure-welding maintenance lever 4, or the pressure welding of a connector 3 It varies in the thickness of memory card 11 etc., or it is changeful, and is the installation length T2 of a coil spring 5. Supposing only variation ΔT changes, as for energization force F1 ' of a coil spring 5, only $k\Delta T$ will change.

[0021] However, since the elastic modulus k of the above-mentioned coil spring 5 is set as the comparatively small value, there is very little change of energization force F1 ', and it is the contact pressure F1 of a contact group. Change is suppressed small. And an electrical connection state with each contact group of a connector 3 will be stabilized, and a faulty connection etc. will be hard to be generated. Moreover, from the contact pressure of a contact group being stabilized, the connector 3 made of an electrical conductive gum and degradation of contact group 11a of memory card by the repeat of memory card attachment and detachment etc. decrease, and the service life of a connector or each contact group is also prolonged. Moreover, endurance, such as a rotation mechanism of the pressure-welding maintenance lever 4, also improves.

[0022] Next, the electronic equipment which built in the memory card wearing equipment of the gestalt of operation of the 2nd of this invention is explained. Drawing 2 is the cross section showing the above-mentioned electronic equipment and the memory card with which it was equipped. As for this electronic equipment 20, the structures of the memory card sink stage and an elastic member differ to the equipment of the gestalt of implementation of the above 1st. Therefore, the portion from which the above differs is explained in detail hereafter. However, the sign of the same composition member as the thing of the equipment of the gestalt of the 1st operation or a portion is explained with the application of the same sign as the sign of the gestalt of the 1st operation shown in drawing 1 .

[0023] In this electronic equipment 20, the memory card sink stage consists of salient 21e which has 21f of inclined planes established in the interior of card

insertion opening 1a of the main part 21 of a device fixed. Memory card 11 is held by this salient 21e in the position of predetermined height.

[0024] Moreover, as an elastic member for connector pressure weldings, an end fixes on the main part 1 of a device, and the flat spring 22 to which the spring contact section is in contact with the field of the opposite side of contact group 2a of the circuit board 2 is applied. The small value is set up like the coil spring 5 which also applied elastic-modulus k' of this flat spring 22 to the gestalt of implementation of the above 1st.

[0025] Next, operation which equips with memory card 11 the electronic equipment 20 of the gestalt of this operation constituted as mentioned above is explained.

Memory card 11 is guided from insertion opening 1a by 21f of salient slant faces, and it inserts until it contacts stopper 1b of the main part of a device. It will be in the wearing state of memory card 11. At this time, contact group 11a of memory card 11 is inserted, sliding with electric conduction contact surface 3a of a connector 3.

[0026] Memory card 11 is positioned by predetermined height by salient 21e in the state of [above-mentioned] wearing. And a connector 3 is somewhat compressed by energization force $F1'$ of a flat spring 22 through the circuit board 2, and it is thickness $T1$. It becomes, and the pressure welding of the electric conduction contact surfaces 3a and 3b of a connector is carried out to contact group 11a of memory card 11, and contact group 2a of the circuit board 2 by the contact pressure $F1$, respectively, and they will be in an electrical installation state. In addition, when removing memory card 11, memory card 11 will be drawn out as it is, and will be taken out.

[0027] in the above, it explained -- as -- the electronic equipment 10 of the form of this operation -- setting -- the wearing state of memory card 11 -- energization force $F1'$ of a flat spring 22 -- the memory card of a connector 3, and contact pressure $F1$ to the contact groups 2a and 11a of the circuit board It is given. From elastic-modulus k' of a flat spring 22 being set up comparatively small like the equipment of the form of the 1st operation also in this case Thickness $T1$ also including the secular change at the time of the height of salient 21e of the main part of a device, or the pressure welding of a connector 3 It varies in the thickness of memory card 11 etc. Or as for a vertical position, change of energization force $F1'$ has few points of the circuit board 2 only by changing somewhat noting that it is changeful, and it is the contact pressure $F1$ of a contact group. There is also little change.

[0028] Therefore, an electrical connection state with each contact group of a connector 3 is stabilized, and a faulty connection etc. does not occur. Moreover, from the contact pressure of a contact group being stabilized, the connector 3 made of an electrical conductive gum and degradation of contact group 11a of memory card by the repeat of memory card attachment and detachment etc. decrease, and a use life is also prolonged. Furthermore, since salient 21e prepared fixed is applied to the main part of a device as a memory card sink stage and a flat spring 22 is applied

as an elastic member, it is effective in thin-shape-izing of the main part 21 of a device.

[0029] In addition, although memory card 11 is slid horizontally and inserted to the main part 10 of a device with the form of the aforementioned implementation, not only this but the insertion method of memory card 11 can take the following methods. That is, opening which can insert memory card in the upper part of a portion in which the connector 3 of the main part of a device is formed is prepared. The point by the side of contact group 11a of memory card prepares the engagement section of the shape of eaves in which a plug is possible in the side in which the connector 3 of this opening is arranged.

[0030] When inserting memory card 11, memory card is leaned and a point is made first inserted and engaged inside the engagement section of the shape of above-mentioned eaves of opening of the main part of a device. Memory card 11 is rotated in the direction in contact with a connector 3 focusing on a point in this state, and contact group 11a and a connector 3 are made into a connection state. Memory card 11 is locked in this state. In addition, the maintenance structure to the main part of a device of a connector 3 presupposes that it is the same as that of the case of the gestalt of the aforementioned implementation.

[0031] (Additional remark) Based on the gestalt of the explained operation, the memory card wearing equipment shown below can be proposed above. Namely, (1) By equipping the predetermined part of electronic equipment with memory card It is memory card wearing equipment which makes it flow through the contact prepared in the above-mentioned memory card, and the contact prepared in the contact attachment component of the above-mentioned electronic equipment electrically. The connector formed in the both sides of the contact prepared in the predetermined field of the above-mentioned memory card, and the contact prepared in the above-mentioned contact attachment component by the electrical conductive gum which carries out a pressure welding and makes electrical installation possible, With the above-mentioned predetermined field of the memory card by which wearing was carried out [above-mentioned], the field of an opposite side in the memory card sink stage located in the predetermined height of the direction of a pressure welding, and the state where it was equipped with the above-mentioned memory card The elastic member which turns the above-mentioned connector to the contact of memory card, and is energized through the above-mentioned contact attachment component, Memory card wearing equipment characterized by supporting the portion in which it is *****ing and the above-mentioned contact is arranged for the above-mentioned contact attachment component in the state where it can displace, to the direction of a pressure welding to the main part of a device. According to the memory card wearing equipment of the above-mentioned additional remark (1), when the amount of [of the above-mentioned contact attachment component] contact surface displaces according to the energization force of the above-mentioned elastic member, the energization force of an elastic

member is transmitted to the above-mentioned connector, and regulation of the contact pressure of a contact of it is attained.

[0032]

[Effect of the Invention] Since it constitutes so that the contact pressure of a connector may be given to an elastic member according to the energization force, though there are dispersion and secular change of a size of a connector, the memory card sink stage, etc. as mentioned above according to the memory card wearing equipment of this invention according to claim 1, the contact pressure of a connector has little change, the electric contact state of the stable connector is acquired, and the endurance of a connector or the contact of memory card also improves further.

[0033] the memory card wearing equipment of this invention according to claim 2 -- the effect of memory card wearing equipment according to claim 1 -- in addition, change of the contact pressure of a connector decreases further and the electric contact state of the connector stabilized more is acquired

[0034] Since the memory card wearing equipment of this invention according to claim 3 can set up an elastic modulus small when a coil spring is applied as an elastic member in addition to the effect of a claim 1 or memory card wearing equipment according to claim 2, the contact state of the connector stabilized more is acquired. Moreover, thin shape-ization of the thickness of the main part of a device is attained at the same time the contact state of the connector stabilized more is acquired, when a flat spring is applied as an elastic member.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The electronic equipment by which the memory card wearing equipment in which the 1st operation gestalt of this invention is shown was incorporated, and the cross section of memory card with which it was equipped.

[Drawing 2] The electronic equipment by which the memory card wearing equipment in which the 2nd operation gestalt of this invention is shown was incorporated, and the cross section of memory card with which it was equipped.

[Drawing 3] The cross section of conventional memory card wearing equipment.

[Description of Notations]

2 Circuit Board (Contact Attachment Component)

2a Contact group (contact of a contact attachment component) of the circuit board

3 Connector

4 Pressure-Welding Maintenance Lever (Memory Card Sink Stage)

5 Coil Spring (Elastic Member)

11 Memory Card

11a Contact group (contact of memory card) of memory card

21e Salient (memory card sink stage)

22 Flat Spring (Elastic Member)

k, k' -- Elastic modulus

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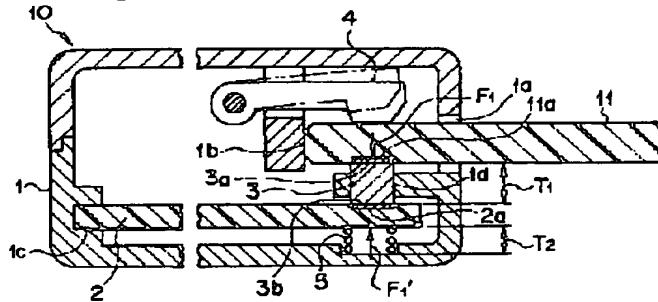
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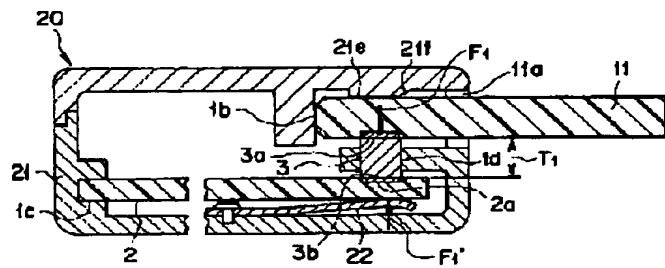
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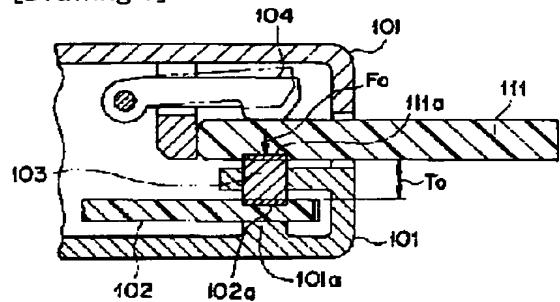
DRAWINGS

[Drawing 1]





[Drawing 3]



[Translation done.]

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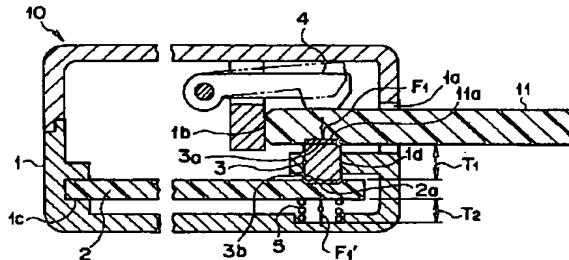
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(54) 【発明の名称】 メモリカード装着装置

(57) 【要約】

【課題】 メモリカードの電気的接続を確実に行うことができるメモリカード装着装置を提供する。

【解決手段】 メモリカード11は機器本体1に挿入し、圧接保持レバー4を圧接位置に回動させるとメモリカード装着状態となる。この装着状態では、コネクタ3は、コイルばね5によって回路基板2を介して上方に付勢されており、導電接触面3a, 3bがメモリカード11の接点群および回路基板2の接点群とに圧接される。上記コイルばね5での弾性係数は小さい値に設定されていることから圧接保持レバー4の位置やコネクタ3の厚みが変化しても圧接力の変化は少なく、コネクタの安定した電気的接觸状態を保つことができる。



【特許請求の範囲】

【請求項1】 メモリカードを電子機器の所定箇所に装着することにより、上記メモリカードに設けられた接点と上記電子機器の接点保持部材に設けられた接点とを電気的に導通させるメモリカード装着装置であって、上記メモリカードの所定の面に設けられた接点と上記接点保持部材に設けられた接点との双方に圧接して電気的接続を可能にする導電ゴムで形成されたコネクタと、上記装着されたメモリカードの上記所定の面とは反対側の面を圧接方向の所定高さに位置させるメモリカード受け手段と、

上記メモリカードが装着された状態で、上記コネクタをメモリカードの接点に向け、上記接点保持部材を介して付勢する弹性部材と、

を具備することを特徴とするメモリカード装着装置。

【請求項2】 上記弹性部材によるメモリカードの接点への付勢力が、上記接点保持部材の所定範囲内の移動に対しては略一定となるように、上記弹性部材の弹性係数が設定されていることを特徴とする請求項1記載のメモリカード装着装置。

【請求項3】 上記弹性部材は、コイルバネ、または、板バネであることを特徴とする請求項1、または、請求項2記載のメモリカード装着装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、メモリカード装着装置に関する。

【0002】

【従来の技術】 近年、弹性变形可能な導電ゴムであって、主に押圧方向である厚み方向の導電性を有し、接続側接点の列方向と直交する線状の導電部と絶縁層が微小ピッチで積層された導電ゴム、例えば、ゼラゴムを、回路基板と液晶表示板との間、あるいは、プリント基板とメモリカードとの間の電気的接続用コネクタとして適用した電子機器が各種商品化されている。

【0003】 上記導電ゴム製コネクタを液晶表示板とのコネクタに適用する電子機器の場合、通常、液晶表示板自体着脱されないのであることから、取り付け部材の関係寸法を所定の精度にすることによって導電ゴム製コネクタの圧縮率が設定され、圧縮力量の範囲を決めることができ、また、取り外し操作もないことから安定した電気的接続状態が得られる。

【0004】 一方、上記導電ゴム製コネクタをメモリカードとのコネクタとして適用するメモリカード装着装置は、例えば、図3の断面図に示すように回路基板102の接続用接点102a上に機器本体側のコネクタ103が配設され、そのコネクタ103の上方にメモリカード押圧用の回動可能な圧接保持レバー104が設けられた構造のものがある。なお、上記コネクタ103の下方の回路基板102の下部は機器本体101の突起部101

aで支持されており、上記圧接保持レバー104の圧接力を受ける。

【0005】 上記メモリカード装着装置の場合、メモリカード111を上記圧接保持レバー104を解放状態にして挿入後、該保持レバー104を圧接方向に回動させることによってメモリカード111の装着状態となる。メモリカード111が装着されると該カード側の接点111aと機器側の接点102aが上記コネクタ103を介して圧接保持レバー104で押圧されて電気的接続状態となり、メモリカードと電子機器との情報の授受が可能となる。

【0006】 なお、上記メモリカード111は、その接続用接点111aとして平面上に配設された多点の金属接点部を有する。一方、上記コネクタ103は、主に押圧方向である厚み方向の導電性を有し、上記接続用接点の列方向に直交する線状の導電部と絶縁層が微小ピッチで積層された弹性变形可能な導電ゴム、例えば、ゼラゴム等で構成されている。

【0007】

【発明が解決しようとする課題】 ところが、上記従来の電子機器等においては、上記コネクタ103の圧接時の厚み寸法T0が圧接保持レバー104の先端部位置、メモリカード100の厚み、回路基板102の厚み、機器ケース支持部101aの突起部の位置で決められ、それらの弹性变形の少ない略剛体の寸法で定まる。一方、ゼラゴムで形成されるコネクタ103の弹性变形による圧縮量により電気的接続のための圧接力が決まる。

【0008】 したがって、上記圧接時の厚み寸法T0やコネクタ103の圧接前の経年変化も加えた厚み等のばらつきで上記圧接力が大きく変化することは避けられず、圧接力が不足したときはコネクタの電気的接続不良となり、過大になればコネクタ103の劣化や接点部分の損傷等を受ける可能性があった。

【0009】 本発明は、上述の不具合を解決するためになされたものであって、メモリカード接続用の機器側コネクタの圧着力量が安定し、経年変化による接触不良等も発生にくく、良好な電気的接続状態が得られるメモリカード装着装置を提供することを目的とする。

【0010】

【課題を解決するための手段】 本発明の第1のメモリカード装着装置は、メモリカードを電子機器の所定箇所に装着することにより、上記メモリカードに設けられた接点と上記電子機器の接点保持部材に設けられた接点とを電気的に導通させるメモリカード装着装置であって、上記メモリカードの所定の面に設けられた接点と上記接点保持部材に設けられた接点との双方に圧接して電気的接続を可能にする導電ゴムで形成されたコネクタと、上記装着されたメモリカードの上記所定の面とは反対側の面を圧接方向の所定高さに位置させるメモリカード受け手段と、上記メモリカードが装着された状態で、上記コネ

クタをメモリカードの接点に向け、上記接点保持部材を介して付勢する弾性部材とを具備する。上記第1のメモリカード装着装置においては、メモリカードを装着後、メモリカード受け手段がメモリカードを所定の位置で保持する状態になると、上記弾性部材の付勢力により上記接点保持部材を介して上記コネクタがメモリカードに向けて圧接される。

【0011】本発明の第2のメモリカード装着装置は、第1のメモリカード装着装置において、上記弾性部材によるメモリカードの接点への付勢力が、上記接点保持部材の所定範囲内の移動に対しては略一定となるように上記弾性部材の弾性係数が設定されている。上記第2のメモリカード装着装置においては、弾性部材の付勢力が略一定に保持され、コネクタのメモリカードへの圧接力も略一定となる。

【0012】本発明の第3のメモリカード装着装置は、第1、または、第2のメモリカード装着装置において、上記弾性部材はコイルバネ、または、板バネである。上記第3のメモリカード装着装置においては、上記コイルバネ、または、板バネの弾性力により上記接点保持部材を介して上記コネクタがメモリカードに向けて圧接される。

【0013】

【発明の実施の形態】以下、本発明の実施の形態を図に基づいて説明する。図1は、本発明の第1の実施の形態を示すメモリカード装着装置が組み込まれた電子機器10と装着されたメモリカードを示す断面図である。本電子機器10に適用されるメモリカード11は、固体メモリが内蔵されたICメモリであり、その挿入方向前方下面部に電気接続用の接点群11aが設けられている。

【0014】上記電子機器10の機器本体1には、先端部に接続用接点群2aを有する接点保持部材としての回路基板2が本体支持部1cにて先端部がコネクタ3を圧接可能な範囲上下変位可能状態で支持されている。また、上記接点群2aの上部に本体支持部1dにて支持されたコネクタ3が配設されている。また、装着されるメモリカード11の接点群11aのある面の反対側の面の位置に作用端部が位置する回動可能なメモリカード受け手段としての圧接保持レバー4が配設されている。

【0015】さらに、回路基板2の接点群2aのある面の反対側の面に当接した状態で機器本体1の取り付けられ、弾性係数kを持つ弾性部材としてのコイルバネ5が配設されている。後述するようにメモリカード11が装着され、圧接保持レバー4により所定の高さに保持された場合、上記コイルバネ5の付勢力F1'により、回路基板2を介して、接点群2aとコネクタ3とメモリカード11の接点群11aとが上記付勢力F1'と略等しい圧接力F1で圧接される状態になる。

【0016】なお、上記コネクタ3は、主に押圧方向である厚み方向の導電性を有し、上記接点群11a、2a

の列方向に直交する線状の微小ピッチの導電部と絶縁層が積層されている弾性変形可能な導電ゴム、例えば、ゼブラゴム等で形成されている。また、コネクタ3の上記接点群11a、2aと接触し、電気接続を可能とする面は、導電接触面3a、3bを形成する。

【0017】次に、以上のように構成された本実施の形態の電子機器10にメモリカード11を装着する動作について説明する。メモリカード11を上記圧接保持レバー4を回動させ、圧接位置から解放した状態で挿入開口1aから機器本体のストップ1bに当接するまで挿入する。その後、圧接保持レバー4を圧接位置に回動させるとメモリカード11の装着状態となる。この状態でメモリカード11は、所定の高さに位置決めされる。そして、コイルバネ5の付勢力によりコネクタ3は多少圧縮され、厚みT1となり、その導電接触面3a、3bがメモリカード11の接点群11aおよび回路基板2の接点群2aとそれぞれ圧接力F1で圧接し、電気的接続状態となり、メモリカードと電子機器との情報の授受が可能となる。

【0018】なお、メモリカード11を取り外す場合は、圧接保持レバー4を解放状態とする。回路基板2の先端部がコイルバネ5の付勢力でわずかに上方向に変位するが、機器本体のコネクタ支持部1dの下面に当接し、メモリカード11はフリーの状態になるので接点群11aへの圧接力はなくなり、取り外し可能となる。

【0019】以上、説明したように本実施の形態の電子機器10においては、メモリカード11の装着状態では、コイルバネ5の付勢力F1'によってコネクタ3のメモリカードと回路基板の接点群2a、11aへの安定した圧接力F1が与えられる。

【0020】すなわち、圧接保持レバー4の高さやコネクタ3の圧接時の経年変化も含めた厚みT1やメモリカード11の厚み等にばらつき、または、変化があって、コイルバネ5の取り付け長さT2が変化量△Tだけ変化したとすると、コイルバネ5の付勢力F1'は、 $k \times \Delta T$ だけ変化する。

【0021】しかし、上記コイルバネ5の弾性係数kが比較的小さい値に設定されていることから付勢力F1'の変化は非常に少なく、接点群の圧接力F1の変化は小さく抑えられる。そして、コネクタ3の各接点群との電気接続状態が安定し、接続不良等が発生しにくくなる。また、接点群の圧接力が安定することから、メモリカード着脱の繰り返し等による導電ゴム製のコネクタ3やメモリカードの接点群11aの劣化が少なくなり、コネクタや各接点群の耐用期間も延びる。また、圧接保持レバー4の回動機構等の耐久性も向上する。

【0022】次に、本発明の第2の実施の形態のメモリカード装着装置を内蔵した電子機器について説明する。図2は、上記電子機器と装着されたメモリカードを示す断面図である。本電子機器20は、前記第1の実施の形

態の装置に対して、メモリカード受け手段と弾性部材の構造が異なっているものである。したがって、上記の異なる部分について、以下、詳細に説明する。但し、第1の実施の形態の装置のものと同一の構成部材、または、部分の符号は、図1に示した第1の実施の形態の符号と同一の符号を適用して説明する。

【0023】本電子機器20において、メモリカード受け手段は、機器本体21のカード挿入開口1aの内部に固定的に設けられた傾斜面21fを有する突起21eで構成される。この突起21eによりメモリカード11は、所定の高さの位置に保持される。

【0024】また、コネクタ圧接用の弾性部材としては、一端が機器本体1に固定され、バネ当接部が回路基板2の接点群2aの反対側の面に当接している板バネ22を適用する。この板バネ22の弾性係数k'も前記第1の実施の形態に適用したコイルバネ5と同様に小さい値が設定されている。

【0025】次に、以上のように構成された本実施の形態の電子機器20にメモリカード11を装着する動作について説明する。メモリカード11を挿入開口1aから、突起斜面21fにガイドされ、機器本体のストップ1bに当接するまで挿入する。メモリカード11の装着状態となる。このとき、メモリカード11の接点群11aは、コネクタ3の導電接触面3aと摺動しながら挿入される。

【0026】上記装着状態でメモリカード11は、突起21eにより所定の高さに位置決めされる。そして、板バネ22の付勢力F1'により回路基板2を介してコネクタ3は多少圧縮され、厚みT1となり、コネクタの導電接触面3a、3bがメモリカード11の接点群11aおよび回路基板2の接点群2aとそれぞれ圧接力F1で圧接され、電気的接続状態となる。なお、メモリカード11を取り外す場合は、メモリカード11をそのまま引き抜いて取り出すことになる。

【0027】以上、説明したように本実施の形態の電子機器10においては、メモリカード11の装着状態では、板バネ22の付勢力F1'によってコネクタ3のメモリカードと回路基板の接点群2a、11aへの圧接力F1が与えられる。この場合も第1の実施の形態の装置と同様に板バネ22の弾性係数k'が比較的小さく設定されていることから、機器本体の突起21eの高さやコネクタ3の圧接時の経年変化も含めた厚みT1やメモリカード11の厚み等にばらつき、または、変化があったとして、回路基板2の先端部が上下位置が多少変動するだけで付勢力F1'の変化は少なく、接点群の圧接力F1の変化も少ない。

【0028】したがって、コネクタ3の各接点群との電気接続状態が安定し、接続不良等が発生しない。また、接点群の圧接力が安定することから、メモリカード着脱の繰り返し等による導電ゴム製のコネクタ3やメモリカ

ードの接点群11aの劣化が少なくなり、使用寿命も延びる。さらに、メモリカード受け手段として機器本体に固定的に設けられる突起21eを適用し、弾性部材として板バネ22を適用することから機器本体21の薄型化に有効である。

【0029】なお、前記実施の形態では、メモリカード11を機器本体10に対して水平方向にスライドして挿入しているが、メモリカード11の挿入方法はこれに限らず、以下のような方法を探ることも可能である。すなわち、機器本体のコネクタ3が設けられている部分の上部にメモリカードが挿入可能な開口を設ける。該開口のコネクタ3が配設されている側に、メモリカードの接点群11a側の先端部が差し込み可能な庇状の係合部を設ける。

【0030】メモリカード11を挿入する場合、まず、メモリカードを傾け、先端部を機器本体の開口の上記庇状の係合部の内側に挿入して係合させる。この状態で先端部を中心にしてメモリカード11をコネクタ3と接触する方向に回動させ、接点群11aとコネクタ3とを接続状態とする。この状態でメモリカード11はロックされる。なお、コネクタ3の機器本体への保持構造は、前記実施の形態の場合と同様とする。

【0031】(付記)以上、説明した実施の形態に基づいて、以下に示すメモリカード装着装置を提案することができる。すなわち、(1) メモリカードを電子機器の所定箇所に装着することにより、上記メモリカードに設けられた接点と上記電子機器の接点保持部材に設けられた接点とを電気的に導通させるメモリカード装着装置であって、上記メモリカードの所定の面に設けられた接点と上記接点保持部材に設けられた接点との双方に圧接して電気的接続を可能にする導電ゴムで形成されたコネクタと、上記装着されたメモリカードの上記所定の面とは反対側の面を圧接方向の所定高さに位置させるメモリカード受け手段と、上記メモリカードが装着された状態で、上記コネクタをメモリカードの接点に向け、上記接点保持部材を介して付勢する弾性部材と、を具備しており、上記接点保持部材が上記接点の配設される部分が機器本体に対して圧接方向に対して変位可能の状態で支持されていることを特徴とするメモリカード装着装置。上記付記(1)のメモリカード装着装置によれば、上記弾性部材の付勢力により上記接点保持部材の接点部分が変位することにより、弾性部材の付勢力が上記コネクタに伝達され、接点の圧接力が調節可能となる。

【0032】

【発明の効果】上述のように本発明の請求項1記載のメモリカード装着装置によれば、弾性部材に付勢力によってコネクタの圧接力を与えるように構成していることから、コネクタやメモリカード受け手段等の寸法のばらつきや経年変化があったとしてもコネクタの圧接力に変動が少なく、安定したコネクタの電気的接続状態が得ら

れ、さらに、コネクタやメモリカードの接点の耐久性も向上する。

【0033】本発明の請求項2記載のメモリカード装着装置は、請求項1記載のメモリカード装着装置の効果に加えて、さらにコネクタの圧接力の変化が少なくなり、より安定したコネクタの電気的接触状態が得られる。

【0034】本発明の請求項3記載のメモリカード装着装置は、請求項1、または、請求項2記載のメモリカード装着装置の効果に加えて、弾性部材として、コイルバネを適用した場合、弾性係数を小さく設定できるので、より安定したコネクタの接触状態が得られる。また、弾性部材として板バネを適用した場合、より安定したコネクタの接触状態が得られると同時に機器本体の厚さの薄型化が可能になる。

【図面の簡単な説明】

【図1】本発明の第1の実施形態を示すメモリカード装着装置が組み込まれた電子機器と装着されたメモリカ

ードの断面図。

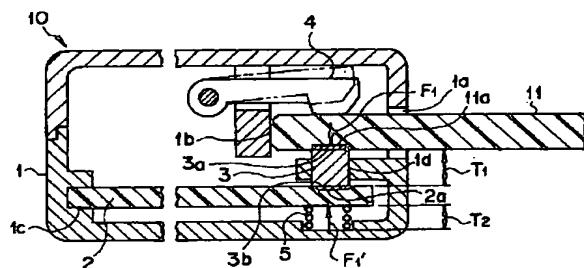
【図2】本発明の第2の実施形態を示すメモリカード装着装置が組み込まれた電子機器と装着されたメモリカードの断面図。

【図3】従来のメモリカード装着装置の断面図。

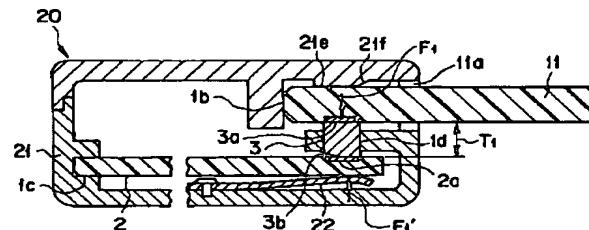
【符号の説明】

- 2 ……回路基板（接点保持部材）
- 2 a ……回路基板の接点群（接点保持部材の接点）
- 3 ……コネクタ
- 4 ……圧接保持レバー（メモリカード受け手段）
- 5 ……コイルバネ（弾性部材）
- 11 ……メモリカード
- 11 a ……メモリカードの接点群（メモリカードの接点）
- 21 e ……突起（メモリカード受け手段）
- 22 ……板バネ（弾性部材）
- k, k' ……弾性係数

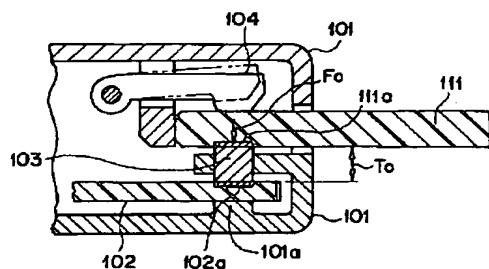
【図1】



【図2】



【図3】



*** NOTICES ***

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Bibliography

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